CLAIMS

1. An apparatus for bending a bar-like dough piece having a length into a predetermined form, comprising:

conveying means for continuously conveying bar-like dough pieces thereon in traveling direction that is substantially orthogonal to the length of each bar-like dough piece;

bending means for bending each incoming bar-like dough piece in symmetrically or asymmetrically with respect to the center of said length of said incoming bar-like dough piece; and

means for substituting at least one of the relationships of the dispositions in said length of said bar-like dough piece of said bending means and said incoming bar-like dough piece with a predetermined position for them.

2. The apparatus as recited in claim 1, wherein said predetermined position is determined so that said bending means bends said incoming bar-like dough piece with a load substantially centrally located in the length of said bar-like dough piece.

3. The apparatus as recited in claim 2, wherein said predetermined relative position is also determined so that said bending means bends said incoming bar-like dough piece with loads substantially symmetrically located with respect to the center of said bar-like dough piece, wherein said substantially symmetrically located loads are orientated inversely with respect to said substantially centrally located load.

4. The apparatus as recited in claim 3, wherein said bent dough piece takes substantially an M-shape.

5. The apparatus as recited in claim 1, wherein said predetermined relative position is determined so that said bending means bends said incoming bar-like dough piece with a load located off-center with respect to the center of the length of said incoming bar-like dough piece.

6. The apparatus as recited in claim 5, wherein said predetermined relative position is also determined so that said bending means bends said bar-like dough piece with loads asymmetrical with respect to the center of the length of said bar-like dough piece, wherein said asymmetrical loads are orientated inversely with respect to said substantially centrally located load.

7. The apparatus as recited in claim 6, wherein said predetermined form is substantially N-shaped.

8. An apparatus for bending a bar-like dough piece having a length into a predetermined form, comprising:

conveying means for continuously conveying bar-like dough pieces thereon in a traveling direction that is orthogonal to the length of said bar-like dough piece;

a first pushing means for pushing said bar-like dough piece onto a first position that is located in said length of said bar-like dough piece;

a first aligning means for aligning said first position of said dough piece with said first pushing means;

a second pushing means for pushing said bar-like dough piece onto the second of two positions that are located in said length of said bar-like dough piece, wherein forces of said second pushing means to be applied to said second positions of said bar-like dough piece are orientated inversely with respect to a force of said first pushing means to be applied to said first position; and

a second aligning means for aligning said second positions of said dough piece with said second pushing means.

9. The apparatus as recited in claim 8, wherein said apparatus further comprises:

means for temporarily holding each conveyed bar-like dough piece; and

means for detecting both ends of said length of said temporarily held bar-like dough piece.

10. The apparatus as recited in claim 9, wherein said first aligning means aligns both said detected ends with predetermined positions that are imaginary ends of both ends of said bar-like dough piece.

11. The apparatus as recited in claim 10, wherein said first position is substantially centrally positioned in the length of said bar-like dough piece.

12. The apparatus as recited in claim 10, wherein said first position is positioned off-center in the length of said bar-like dough piece.

13. The apparatus as recited in claim 9, wherein said apparatus further comprises means for measuring the length of said bar-like dough piece based on both said detected ends.

14. The apparatus as recited in claim 13, wherein said apparatus further comprises:

means for determining the degree of the pushing with said second pushing means against said second positions of said dough piece based on said measured length of said bar-like dough piece; and

means for controlling the actual degree of the pushing with said second pushing means against said second positions of said dough piece based on said determined degree.

15. The apparatus as recited in claim 14, wherein said first aligning means aligns said bar-like dough piece based on said measured length of said bar-like dough piece.

16. The apparatus as recited in claim 15, wherein said first position is substantially centrally positioned on said bar-like dough piece.

17. The apparatus as recited in claim 15, wherein said first position is positioned off-center on said bar-like dough piece.

18. A method for bending a bar-like dough piece having a length into a predetermined form, said method comprising the steps of:

a) continuously conveying bar-like dough pieces in a traveling direction that is substantially orthogonal to the length of each bar-like dough piece;

b) determining a plurality of actual positions to be bent on the length of each bar-like dough piece;

c) substituting said determined actual positions with predetermined positions; and

d) bending said bar-like dough piece at said predetermined positions that are symmetrical or asymmetrical with respect to the center of said length of said bar-like dough piece.

19. The method as recited in claim 18, wherein said determining step includes a step for determining the center of said length of said bar-like dough piece.

20. The method as recited in claim 18, wherein said determining step includes a step for determining the length of said bar-like dough piece.